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PLANNING, CONTROL AND MONITORING OF PROJECTS OF DISTRIBUTION OF GRID EXPANSION

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INTRODUCTION

The companies of different economic sectors are constantly confronted with the need for varied projects that are vital to their development and competitiveness. Within the areas of knowledge management and project management, Planning, Project Monitoring and Control is an essential for the successful implementation of development investments. At the end of the program participants will learn the conceptual and be able to apply a rational and efficient planning, monitoring and controlling of process projects. Also apply the tools and methodologies for planning, monitoring and control of projects.

OBJETIVES

- Distinguish the importance and the role of planning, monitoring and control for effective project management.
- Understand the conceptual basis and be able to apply a rational and effective to plan, monitor and control projects process.
- Perform an important practical contribution to the implementation of concrete projects related to their specific work environment.

ABSTRACT

The project as a system

A project is a set of interrelated activities and coordinated to achieve a target within the limits set by budget, and qualities previously established time frame previously defined.

Financial Analysis

Before deciding the execution of a project is necessary to perform a cost benefit analysis thereof defining the physical and financial variables to be taken into account to determine if it is profitable, through a cash flow which considered all Expenditures that we he performed during the execution of all project activities and Income we will throughout the evaluation period thereof including the projected benefits, then is calculated **Net (NPV) Present Value**.

In business investment projects is used to set the discount rate as the average cost of capital that is holding the company, thus if the NPV of the investment project analyzed is positive (greater than zero) indicate that it will generate wealth for the company beyond the return on capital invested in the project and fully funded by others, indicating that we are demanding a wealth of project contribution above that minimum rate.

In addition to the NPV is necessary to calculate the **Internal Rate of Return (IRR)**. If we finance the investment at an equivalent cost to that rate the project would not bring wealth and economic cost any.

Finally **Period Return on Investment (PRI)** is calculated, to know the payback period of the investment, if the Rate of Return on Investment (IRR) is less than 14% and the NPV is negative the Project is Profitable.

Planning and control of projects

To plan, manage and monitor projects Distribution Network Expansion at all stages, you need to define indicators of control and monitoring of all the activities that make up a project, in the case of the indicators of the project mentioned above is necessary to define the most important financial indicators and the most relevant Physical Indicators required to daily monitoring.

The most important to follow a project **financial indicators** are: Approved Budget Plan Works Available Budget, Budget Incurred, % Committed Budget and Budget Execution.

Physical Indicators to consider include: KmsGrid Medium Voltage, Low Voltage GridKms, No. Transformer, Apparent Power Installed, Number of Housing Benefited.

Software Development for Control and Monitoring Indicators

Before starting with the development of software for control and monitoring of all project activities, it is necessary to have the Construction Standards Electrical Distribution Lines, then must calculate the cost structure of all activities associated with the project implementation, i.e. it is necessary to calculate Personnel Costs, Transportation Costs and Labor costs.

Calculate Cost Structure Project Implementation Activities

Cost estimates Manpower performed considering the payment of all benefits established by the existing labor law in the country, such benefits as: Salary, Social Security, retirement fund provisioning, thirteenth month payment wage and Administrative Expenses

Description	Basic Salary	2% Training	15% Social Security	8% Holidaytime	8% ThirteenthSalary	8% Clearance	15% Administration	12% Utility	Total
Lineman B	C$ 7,683.50	C$ 153.67	C$ 1,152.53	C$ 640.04	C$ 640.04	C$ 640.04	C$ 1,636.47	C$ 1,309.18	C$ 13,855.45
Lineman C	C$ 7,196.20	C$ 143.92	C$ 1,079.43	C$ 599.44	C$ 599.44	C$ 599.44	C$ 1,532.68	C$ 1,226.15	C$ 12,976.71

You need to determine the cost of a Time / Man for each charge of Personnel that will participate in the implementation of all project activities such:

Description	Basic Salary	Monthly Salary Including Benefits and Utilities	Replacement Cost Uniform Tools and Safety Equipment	Total Cost	Cost Time / Man
Lineman B	C$ 7,683.50	C$ 13,855.45	C$ 895.66	C$ 14,751.11	C$ 186.72
Lineman C	C$ 7,196.20	C$ 12,976.71	C$ 863.47	C$ 13,840.18	C$ 175.19

Regarding calculations on Transportation Costs to move the Personal and Work teams to the site of the work, it is necessary to consider all the variables that affect the calculation of one-hour use of a means of transport necessary for the execution of a work as described below:

CONCEPT NAME	COST OF ACTIVITY	FREQUENCY	COST/HOUR
Maintenancecosts 4-ton truck			C$ 460.92

CONCEPT NAME	COST OF ACTIVITY	FREQUENCY	COST/HOUR
Preventive Maintenance	C$ 7,979.40	Cada 5,000 Kms.	C$ 80.15
Changing tires	C$ 19,948.50	Cada 35,000 Kms.	C$ 32.72
Batteryreplacement	C$ 3,989.70	Cada 50,000 Kms.	C$ 8.01
Insurancepayment	C$ 1,462.89	1x per year	C$ 3.25
Fuel consumption	C$ 336.80	Each 106 Kms.	C$ 336.80
Administrative costs for the use of 4-ton truck			C$ 124.45
Administration (15%)			C$ 69.14
Utilities (12%)			C$ 55.31
Hourly Cost Depreciation use 4-ton truck	C$ 540,697.34	Accumulated in 5 years	C$ 20.79
Financing costs to purchase 4-ton truck	C$ 209,124.12	Once in 5 years	C$ 9.29
Total cost of Use by Time 4-ton truck			C$ 615.45

Before calculating the **costs of materials** necessary for the execution of works standardize the names of all the materials distribution, i.e. ensure that all items of the same type have the same description, then a quote unit price is of all materials requesting this information to all the major suppliers of the local market.

Knowing the Unit Cost of Manpower handling charges and the cost of using an hour of a means of transport, it is necessary to measure the time required for implementation of each activity execution of a project with the total cost of each activity the sum of costs of Manpower, Sum of Transport costs plus the sum of the cost of all necessary to implement this activity materials as detailed below.

Assemble: 0314301000 Alignment and angle to 5 °

LABOR

CATEGORY	MAN HOURS	UNIT PRICE OF TIME MAN	COST OF LABOR
Foreman	0.18	C$ 340.46	C$ 61.28
Lineman B	0.18	C$ 186.72	C$ 33.61
Lineman C	0.18	C$ 175.19	C$ 31.53
LABOR COST			C$ 126.42

TRANSPORTATION

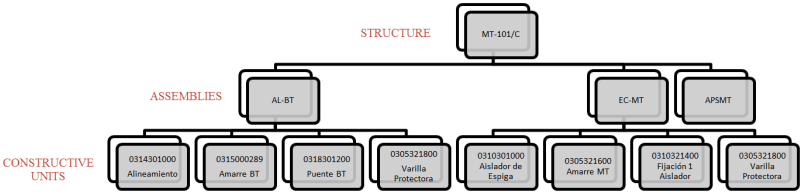
CATEGORY	HORAS DE USO	TRANSPORT UNIT PRICE PER HOUR	TRANSPORTATION COST
4 Ton Truck	0.06	C$ 615.45	C$ 36.93
TOTAL COST TRANSPORTATION			C$ 36.93

MATERIALS

Material Code	AL-BT Assembly Materials description	Quantity	Unit. Cost	Total Cost
104010812	AISLADOR PORCELANA TIPO CARRETE - ANSI 53-2	1	C$ 14.19	C$ 14.19
10402083 5	ARANDELA GALV. CURVA CUADRADA 2-1/2" X 2-1/2" x 3/16" p/p 5/8"	1	C$ 14.85	C$ 14.85
104020836	ARANDELA GALVANIZADA DE PRESION P/P 5/8	1	C$ 2.97	C$ 2.97
104020958	PERNO DOBLE TOPE PARA NEUTRO 5/8"x10"	1	C$ 112.06	C$ 112.06
102050310	GRAPA CONEXIÓN CABLE TIERRA SIN TORNILLO P/PERNO 5/8	1	C$ 76.32	C$ 76.32
102010105	CONDUCTOR COBRE DESNUDO 7 HILOS NO 2 AWG	0.25	C$ 57.33	C$ 14.33
TOTAL MATERIAL COSTS				C$ 234.72

As we can see the total cost for the AL-BT assembly (Labor + Transport + Materials) is C$ 398.07.

Scheme of forming a structure of the Standard Building Distribution Lines in Nicaragua(MT-101/C formed by the Assemblies: AL-BT, EC-MT y APSMT)



Lifecycle of a Project

A project is developed in the following stages: Diagnosis, Design, Tendering, Award, Recruitment, Execution, Billing.

Diagnosis of a project: It is a process of analysis and synthesis of a social reality, detected a problem or need, you should provide a description of the various components of this social reality, in addition to determining the link between the different elements of the problem. Any diagnosis aims to gain knowledge that will enable us to make design changes aimed to solve problems or meet needs that we detected in a community.

Designing a Project: is the process of developing the proposed work according to guidelines and systematic procedures as already mentioned, a good design should identify beneficiaries and stakeholders; identify possible strategies to face it and justify it; project objectives (general and specific); results or expected outputs and activities and necessary minimum resources, project designs expansion of distribution networks electromechanical memories calculations, voltage drop calculations and selection of drivers, Budget Execution and descriptive project plans are made.

In project management software expansion of distribution networks are enlisted annual work plans, defining works plan, uploading documents electromechanical design and budgeting works with bases values previously entered into the system.

Bidding Works: is the process of invitation to tender services expanding distribution networks, evaluating the most suitable proposal for the Company in Software Management Works are enlisted all contracts for execution of works for the system to apply prices of execution of works contract when a job is awarded to a particular contractor.

Works Division and Award: This is a management software module works in which the activity of Distribution Budget Design is performed on all jobs that have been divided on a work, then a contractor is awarded for the system applied the prices of contract.

Execution of Works: This is a Works Management module in which the following implementation activities are performed: Payload field Rethinking Work, Work Order Generation, Generation output document materials, processing Reforming the scope of jobs, Materials and Balance Act of Settlement of final Scope of work (Act Technical Labour Front).

Billing: This is a module Management Software Works where the process of forming bill received all jobs performed by the supervisor.

CONCLUSIONS

In conclusion to be in control and monitoring of all projects to expand distribution networks, it is necessary to make a good analysis of profitability, have a working tool for the proper control and monitoring of all activities carried out in the project development.

ДЕЯКІ АСПЕКТИ СУЧАСНИХ ТЕХНОЛОГІЙ ВИКОРИСТАННЯ ЕНЕРГІЇ СОНЯЧНОЇ РАДІАЦІЇ У ВИРОБНИЦТВІ ЕЛЕКТРОЕНЕРГІЇ

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Сучасні технології використовують енергію сонячної радіації для виробництва електроенергії, як правило, двома способами: 1) з прямим перетворенням енергії сонячної радіації в постійний електричний струм; 2) з трансформацією енергії сонячної радіації в електроенергію в сонячних електростанціях.

На широті міста Києва на 1 м^2 площі горизонтальної поверхні за стандартного природного освітлення за 1 годину надходить сонячна радіація еквівалентна 1 кВт електроенергії.

Панель сонячної батареї – це сукупність об'єднаних напівпровідникових фотоелектричних перетворювачів (зазвичай кремнієвих), які безпосередньо перетворюють енергію сонячної радіації в постійний електричний струм.

Перевагами сонячних батарей є: незначні маса та розміри, відносна простота конструкції, значний термін експлуатації (до 20 – 25 років).

Недоліками сонячних батарей є: значна залежність від кліматичних та погодних чинників; залежність вихідної електричної потужнос-